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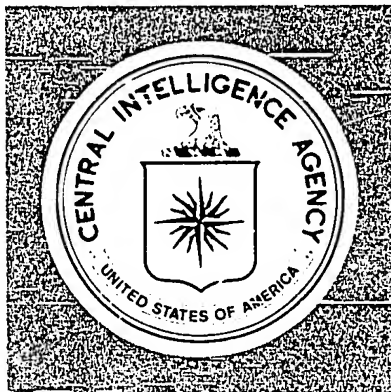
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Weekly Surveyor

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25 August 1975

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WEEKLY SURVEYOR

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USSR AND EASTERN EUROPE

stress.

The Soviets plan for the breeder reactor at Shevchenko to be fully operational by late August or September using five of its six coolant loops; the last coolant loop to fail will not be ready until after September. Although the reactor will be capable of generating full power, the Soviets plan to bring it to this level in a slow and cautious manner.

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Soviet knowledge of modern animal nutrition is inadequate for its livestock expansion program. The Soviets are looking to the US for the information they need.

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Soviet capability to study and exploit crop/weather stress has been enhanced by the acquisition of 180 US-made plant growth chambers. In the near term, this capability is directed toward development of drought and cold resistant crops, particularly the grains. A second longer term goal may be to provide a scientific basis for mitigating the effects on crops of major climate changes.

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A Soviet medical journal recently reported on changes in blood electrolyte levels observed in submarine crew members. These changes are best explained by hypothesizing a combination of stresses such as inadequate ventilation and air condition, the presence of noxious atmospheric microcontaminants, concomitant with increased physical and psychological

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The Soviet military dolphin research should benefit from the research conducted at the Batumi oceanarium in the care and maintenance of dolphins. The behavioral training research at Batumi, however, probably will not produce any significant advances.

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on submersibles.

The Soviets have purchased six transmitters and six flashers designed for use

SOUTHEAST ASIA

Cholera has now spread from Cambodia to Laos, Vietnam, and Thailand. Health conditions are currently poor in all of these countries, and there is danger of a general cholera epidemic throughout Southeast Asia.

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NUCLEAR ENERGY

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Soviets Plan Breeder Reactor at Shevchenko to be Fully Operational Soon: The BN-350 is now generating a small amount of electric power on one coolant loop. With five out of six coolant loops operating by late August or September, the BN350 will be capable of generating full power; the Soviets plan to slowly and cautiously bring it to full power. [REDACTED]

Comment: The Soviets are planning to start full operation using five out of six coolant loops because the last coolant loop to fail (caused by steam generator trouble) will not be ready until after September. The quality control measures being implemented during repairs of BN-350 steam generators are very thorough. Apparently the Soviets are tired of having problems with FBR steam generators due to poor quality control. After intensive quality control testing, it was believed that the last steam generator failure was not due to poor quality control at Shevchenko but to a basic material problem at the factory where the tubing was manufactured. [REDACTED]

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LIFE SCIENCES

Cholera Spreads from Cambodia to Laos, Vietnam, and Thailand: [REDACTED]

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[REDACTED] cholera was spreading in the rural areas of Cambodia, Laos, Vietnam, and Thailand. [REDACTED]

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[REDACTED] the large-scale movement of Cambodians from urban to rural areas accelerated the spread of the disease. In Thailand, there are so few physicians that many cholera cases go unreported, and for that reason there are no reliable figures on incidence. [REDACTED]

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Comment: The cholera outbreak in Cambodia that attended the forced mass movement of people in April and May became an epidemic by mid-June. Although the Cambodian epidemic clearly provided a direct cholera threat to Thailand and Vietnam, this is the first report to indicate that the disease did in fact spread to those countries. It is also no surprise that the disease is present in Laos because health conditions there have deteriorated markedly during the past few months.

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Cambodia, Thailand, Vietnam, and Laos all suffer now from acute shortages of physicians and drugs in the cities. Rural areas in these countries never received adequate medical coverage, and living conditions and sanitation are primitive throughout the area. These conditions plus weather conditions favorable to the spread of cholera are likely to result in the disease becoming generally endemic throughout Southeast Asia. This, in turn, would result in significant cholera outbreaks each year, any one of which could become an epidemic. [REDACTED]

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Soviets Purchase Submersible Support Equipment for Military Dolphin Program: In the spring of 1975 V.Ye. Sokolov, a key figure in the Soviet marine mammal program, purchased from a US firm six transmitters and six flashers designed for use on submersibles. The transmitter is a compact, self-contained radio beacon. The flasher is also a compact, self-contained unit designed as a recovery aid for free-vehicle instruments, free

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[REDACTED]

swimming divers, and general surface marking applications. The submersible transmitter is actually designed primarily for "free vehicle" instrument packages and for submarines. The US firm also makes a version of the transmitter which is modified specifically for use on marine mammals. It is not clear why Sokolov did not order the marine mammal version of the transmitter; however, the necessary adaptation can be made without much difficulty. [REDACTED]

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Soviets Describe Physiological Research During Submarine Patrols: A Soviet medical journal recently reported on changes in blood electrolyte levels observed in 35 submarine crew members. The levels were measured before, during, and after a long cruise. The pre-cruise value for each electrolyte studied approximated its normal physiological value, however, those observed after two weeks on the submarine were substantially altered from the normal limits. Five to six weeks into the cruise the values began to normalize, but they still had not returned to their original levels and still were not normal up to one month following the cruise. In the post-cruise period there were also complaints of leg muscle pain and considerable swelling. [REDACTED]

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Comment: The changes in blood chemistry are best explained by hypothesizing a combination of stresses such as inadequate ventilation and air conditioning, and the presence of noxious atmospheric microcontaminants concomitant with increased physical and psychological stress. The reported problems, not encountered in the US

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submarine service, are not life-threatening but clearly demonstrate measurable effects that must be corrected to achieve optimum crew performance, pre-cruise training, and submarine life support systems.

This study is consistent with a number of Soviet papers published in the past 2 to 3 years which described the physiological effects of long submarine cruises. The article supports the earlier Soviet assertion that the first 2 weeks of a submarine patrol is a "period of development of physiological stress" which is not related to poor health or diet.

The magnitude of the observed blood chemistry changes and the tendency of the values to return toward normal limits with the retention of some slightly abnormal values one month after the cruise implies that both physiological and psychological adaptation are occurring slowly, and that the stresses are never completely removed during the cruise. The 35 crew members used in this study may have been relatively new to the submarine service or even on their first patrol, a factor which could induce both physiological and psychological stress.

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Dolphinarium at Batumi May Benefit Soviet Military Dolphin Research: The public oceanarium in Batumi, located near the Batumi Naval Base, is reportedly engaged in all facets of dolphin research. No military personnel were seen associated with the facility, and there were no areas where access was limited or restricted. In addition, no perimeter fence or other security barriers were observed.

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AGROTECHNOLOGY AND FOOD RESOURCES

Soviets Seek Badly Needed US Livestock Nutrition Data: A Soviet delegation of livestock nutrition specialists visited the US in June and July. Numerous questions were asked by the delegation on waste recycling, manure feeding, preparation and use of pre-mixes, calf feeding, and grain preservation. The delegation's primary interest was in urea feeding and nitrogen utilization, and in a recently developed feed supplement antibiotic which facilitates a dramatic improvement in feed utilization in cattle. The head of the Soviet delegation proposed a US-USSR scientific exchange of information on the use of feed additives for improving livestock feeding programs.

Comment: The Soviet interest in livestock nutrition ties in with their goal of constructing more than 1,000 cattle feedlots in the next 5 years, each having the capacity to feed 20,000 to 30,000 animals. The present Soviet domestic approach to animal nutrition is entirely inadequate for such a program. As late as October 1974 a US Livestock Production Team touring the USSR noted an apparent disinterest in livestock nutrition.

Feed is the most important factor in animal husbandry. Shortages of high protein feed in the USSR make it imperative that the Soviets get the most for their "feed-ruble" if they have any hope of succeeding in their ambitious meat-expansion program. Soviet agriculturists are only beginning to realize the advantages in the feed conversion efficiency of quality livestock, together with nutritious, scientifically balanced feed materials.

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Soviets Increase Their Crops Research Capability Related to Weather Stress: In July the chief designer of the Agrophysical Research Institute, Leningrad, indicated that the 180 US-made plant growth chambers already purchased by the Soviets are being installed in plant physiology and plant breeding institutes at Kiev, Moscow, Leningrad, Chelyabinsk and Messoyakhskaya. The Soviets plan to negotiate for an additional purchase of a large number of cabinet and walk-in chambers in early 1977,

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which they plan to install at major agricultural schools throughout the USSR. [REDACTED]

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Comment: These growth chambers further enhance the Soviet capability to study and exploit crop/weather stress interrelationships, particularly in relation to cold and drought.

This Soviet capability is believed to be directed toward two practical goals. The near term goal would be the development of high yielding crop varieties (primarily grains) capable of withstanding the effects of weather fluctuations. The impact of these fluctuations is exemplified by the current drastic reduction of the Soviet grain crop, largely due to weather problems. Two major problems are winter kill in winter wheat areas and drought in spring wheat areas. A second longer term goal may be to utilize these facilities to provide for a scientifically based adjustment of crops and cropping patterns to mitigate the impact of any projected major climate change.

A phytotron (controlled artificial climate facility), reputedly the largest in the world, should be nearing completion at a major grain breeding institute in Odessa. Identical, but somewhat smaller phytotrons are planned or being built at two other major grain breeding institutes in Krasnodar and at Mironovka. These phytotrons will facilitate large scale evaluation of genetic stocks and varieties against a wide range of environmental stresses. In addition, three generations of plants can be grown annually, thereby accelerating the rate of development and introduction of improved grain varieties.

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